DOCUMENT RESUME

ED 107 979 95 CE 004 192

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TITLE An Analysis of the Residential Remodeling Occupation.
INSTITUTION Ohio State Dept. of Education, Columbus. Div. of Vocational Education.; Ohio State Univ., Columbus. Trade and Industrial Education Instructional Materials Lab.
SPONS AGENCY Office of Education (DHEW), Washington, D.C.
PUB DATE [75]
NOTE 83p.; For related documents, see CE 004 160-191, CE 004 193-206, CE 004 263-268, and CE 004 425-427

EDRS PRICE MF-$0.76 HC-$4.43 PLUS POSTAGE
DESCRIPTORS *Building Improvement; *Building Trades; Communication Skills; Construction (Process); *Job Analysis; Knowledge Level; *Occupational Information; Safety; Skill Analysis; Skill Development; Skilled Occupations; *Task Analysis; Task Performance; Work Attitudes
IDENTIFIERS *Residential Remodeling

ABSTRACT

The general purpose of the occupational analysis is to provide workable, basic information dealing with the many and varied duties performed in the residential remodeling occupation. The analysis only briefly covers the many areas of residential remodeling. The document opens with a brief introduction followed by a job description. The bulk of the document is presented in table form. Four duties are broken down into a number of tasks and for each task a two-page table is presented, showing on the first page: tools, equipment, materials, objects acted upon; performance knowledge (related also to decisions, cues and errors); safety--hazard; and on the second page: science; math--number systems; and communications (performance modes, examples, and skills and concepts). The duties listed are: performing exterior work on walls; reroofing a house; enlarging a room; and adding a room. The document concludes with two appendixes outlining hiring, professionalism and supervisory qualifications; and basic geometry skills and concepts. (BP)

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Occupational Analysis

ED107979

CE004192

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RESIDENTIAL REMODELING CONSTRUCTIONIST

Instructional Materials Laboratory
Trade and Industrial Education
The Ohio State University

5153

AN ANALYSIS OF THE RESIDENTIAL REMODELING OCCUPATION

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Occupational Analysis
E.P.D.A. Sub Project 73402
June 1, 1973 to December 30, 1974
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The Instructional Materials Laboratory
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"The activity which is the subject of this report was supported in whole or in part by the U.S. Office of Education, Department of Health, Education, and Welfare. However, the opinions expressed herein do not reflect the position or policy of the U.S. Office of Education, and no official endorsement by the U.S. Office of Education should be inferred."

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FOREWORD

The occupational analysis project was conducted by The Instructional Materials Laboratory, Trade and Industrial Education, The Ohio State University in conjunction with the State Department of Education, Division of Vocational Education pursuant to a grant from the U.S. Office of Education.

The Occupational Analysis project was proposed and conducted to train vocational educators in the techniques of making a comprehensive occupational analysis. Instructors were selected from Agriculture, Business, Distributive, Home Economics and Trade and Industrial Education to gain experience in developing analysis documents for sixty-one different occupations. Representatives from Business, Industry, Medicine, and Education were involved with the vocational instructors in conducting the analysis process.

The project was conducted in three phases. Phase one involved the planning and development of the project strategies. The analysis process was based on sound principles of learning and behavior. Phase two was the identification, selection and orientation of all participants. The training and workshop sessions constituted the third phase. Two-week workshops were held during which teams of vocational instructors conducted an analysis of the occupations in which they had employment experience. The instructors were assisted by both occupational consultants and subject matter specialists.

The project resulted in producing one hundred two trained vocational instructors capable of conducting and assisting in a comprehensive analysis of various occupations. Occupational analysis data were generated for sixty-one occupations. The analysis included a statement of the various tasks performed in each occupation. For each task the following items were identified: tools and equipment; procedural knowledge; safety knowledge; concepts and skills of mathematics, science and communication needed for successful performance in the occupation. The analysis data provided a basis for generating instructional materials, course outlines, student performance objectives, criterion measures as well as identifying specific supporting skills and knowledge in the academic subject areas.

PREFACE

The purpose of this work is to develop a task analysis in residential remodeling. This field is very broad, crossing many skilled areas. Due to lack of time and ability a brief part has been covered. It is hoped that this effort might be of some help to the reader.

ACKNOWLEDGMENT

We wish to acknowledge the valuable assistance rendered by the following subject matter specialists. They provided input to the vocational instructors in identifying related skills and concepts of each respective subject matter area and served as training assistants in the analysis process during the two-week workshops.

Rollin M. Barber, Psychology
The Ohio State University
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Jim VanArsdall, Mathematics
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Lillian Yontz, Biology
The Ohio State University
Caldwell, Ohio

Acknowledgment is extended to the following I.M.L. staff members for their role in conducting the workshops; editing, revising, proofing and typing the analyses.

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JOB DESCRIPTION

The job of remodeling covers carpentry, plumbing, electricity, masonry, roofing, painting, and decorating. Many other skilled areas are touched upon. The stress in this occupation seems to fall in the area of troubleshooting, planning procedures, and carrying out the wishes of the customer.

A knowledge of building nomenclature is a must. Much of the trade can only be learned by on-the-job experience.

Duty A Performing Exterior Work on Walls

1 Remove old materials from exterior walls
2 Inspect the rough framing for soundness, replace studs
3 Install siding
4 Apply exterior trim
5 Hang new gutters and downspout (aluminum)
6 Paint exterior

(TASK STATEMENT) REMOVE OLD MATERIALS FROM EXTERIOR WALLS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Straight claw hammer Large screwdriver Wrecking bars Off-set bars Nail pullers Handsaw Folding rule Square Tri-square Planes Miterbox Chisels Plumb bob Electric skill saw Electric saber saw Vice grips Crescent wrenches Hacksaw Chalkline Levels Tape measure Pop rivot gun Tin shears (3) Shangle knife Flashlight Extra light Sledge hammer Pipe wrenches Tubing cutter Threader Torch Staple gun Nail set Exacto-knife Wide putty knife Corner blaster applicator Gutters, drains Trim Siding	Remove gutters Remove trim Remove siding	SAFETY Secure ladders well Wear safety hat and glasses Wear hard sole shoes Wear gloves HAZARD Falling from ladder Falling objects Splinters, nails
DECISIONS	**CUES**	**ERRORS**
Determine condition of existing structure Determine how the materials are fastened Determine starting point Determine salvagability of materials	Cracks Sound test, tapping Plans of the owner, importance of time Visual inspection	Main structure is not sound misjudged Materials cannot be saved Does not follow correct procedure

(TASK STATEMENT) REMOVE OLD MATERIALS FROM EXTERIOR WALLS

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage Resistance of materials to change in shape BEHAVIORAL SCIENCE Hiring - exhibit capacity to ascertain personal qualities (skills, knowledge, character, flexibility, learning capacity) Professionalism - maintain capacity to foster trust and cooperation; to cope with conflict behavior; exhibit qualities of self-confidence, self-control, self-reliance, self-respect and adaptability Attributes of maximum functioning capacity Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation Conscious awareness of physical expressions basic to peak physical performance Conscious awareness of qualities basic to optimal mental performance Emphasis on awareness of safety, body rhythm, observation, alertness and organization	Set of real numbers [all positive numbers] Use of numbers (without calculation) - counting, coordinate system, ordering, indexing, coding, ratio, measurement, recording Fundamental operations (calculation) - addition, subtraction, multiplication and division algorithms, and order of operations, i.e., use of parentheses in simplifying arithmetic expressions Measurement: geometric - area [square measure]

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Viewing	Inspection	Visual analysis, memory, logic, color discrimination, comprehension
Reading		Process report and instructions
Touching	Manual Pushing to see if it feels solid	Texture, movement

(TASK STATEMENT) INSPECT THE ROUGH FRAMING FOR SOUNDNESS, REPLACE STUDS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit	Visually inspect wood Test by hammering on each stud Use tape measure to check diagonally for square Remove bad stud cautiously Use level to check plumb	SAFETY Wear hard hat, safety glasses, hard soled shoes, and gloves HAZARD Falling objects Splinters Stepping on nails

DECISIONS	CUES	ERRORS
Determine condition of rough framework Determine replacement of studs, etc. Determine squareness and plumb	Cracks, rot. strength Diagonal measurements are not equal Level bubble is off center in vertical or horizontal checks	Read tape or level wrong Disturb structure while putting in new studs

(TASK STATEMENT) INSPECT THE ROUGH FRAMING FOR SOUNDNESS, REPLACE STUDS

SCIENCE	MATH NUMBER SYSTEMS
PHYSICAL SCIENCE Composition of matter Relationship of force to distortion in an elastic body Resistance of materials to change in shape BEHAVIORAL SCIENCE Hiring - exhibit capacity to ascertain personal qualities (skills, knowledge, character, flexibility, learning capacity) Professionalism - maintain capacity to foster trust and cooperation; to function efficiently when encountering fast changing, multiple, personal or situational variables; exhibit qualities of self-confidence, self-control, self-reliance, self-respect and adaptability Supervision - maintain customer's illusion of privacy by avoiding excessive noise or movement; communicate pride in establishment Attributes of maximum functioning capacity (see Appendix A)	Basic arithmetic skills and concepts Estimation Ratio and proportion Basic measurement skills and concepts Measure sense/role of unit Instrument - tape Measurement: geometric - linear Deductive/inductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Listening	Tapping on wood	Auditory discrimination, noise discrimination
Viewing	Inspecting	Visual analysis, memory, logic, color discrimination
Touching	Cracks, rot	Texture, consistency, movement

(TASK STATEMENT) INSTALL SIDING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Scaffolding Siding Fasteners	Measure Strike line on wall Position the siding to line Secure siding Complete installation to manufacturer's specifications	SAFETY Wear hard hat, gloves, hard soled shoes Check scaffolding for strength HAZARD Splinters Flying metal off nail heads Falling boards Falling off scaffold

DECISIONS	CUES	ERRORS
Determine if the level is certain Determine if the butt ends are square Determine where the breaks should occur	Visually looks wrong Ends are not running vertically square with rough structure	Square has been damaged Level is off Rough structure is not plumb or square

(TASK STATEMENT) INSTALL SIDING

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Resistance of materials to change in shape Simple machines used to gain mechanical advantage [hammer] Work input, work output, friction and efficiency in simple machines Relationship of force to distortion of an elastic body BEHAVIORAL SCIENCE Hiring - exhibit capacity to ascertain personal qualities; to accurately reflect environment and job expectations Professionalism - maintain capacity to foster trust and cooperation; to cope with conflict behavior; to generate integrity; to function capacity to function efficiently when encountering fast changing, multiple, personal or situational variables Supervision - maintain customer's illusion of privacy by avoiding excessive noise or movement; grant appropriate regard for customer's unique needs; communicate pride in establishment Attributes of maximum functioning capacity (see Appendix A)	Basic arithmetic skills and concepts Reduction of fractions Ratio and proportion Properties of the real number system - commutative, associative and distributive Measurement: geometric - linear Knowledge of geometric relationships [parallel] Geometric constructions [perpendicular to lines] Deductive/inductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Book	Comprehension, instructions–process report
Viewing	Inspection, checking	Visual analysis, memory, logic, detail/inference

(TASK STATEMENT) APPLY EXTERIOR TRIM

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Scaffolding Fasteners Trim for windows, doors, corners	Layout trim Mitercut ends, trim corners Position trim Secure trim	SAFETY Hard hat, safety shoes, safety glasses, gloves
DECISIONS Determine if existing doors and windows are square Determine how much to trim off corner pieces Determine how to hit a stud when nailing	**CUES** Square fits window - no light showing Test nails by striking stud	**ERRORS** Misread structure detail plan

(TASK STATEMENT) APPLY EXTERIOR TRIM

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [hammer] Work input, work output, friction and efficiency in simple machines [size of hammer] Relationship of force to distortion in an elastic body Resistance of materials to change in shape [bending nail] BEHAVIORAL SCIENCE Hiring - exhibit capacity to ascertain personal qualities; to foster trust; to accurately reflect plant environment and job expectations Professionalism - Maintain capacity to foster trust and cooperation; to generate integrity; to cope with conflict behavior; exhibit qualities of self-confidence, self-control, self-reliance, self-respect and adaptability Supervision - maintain customer's illusion of privacy by avoiding excessive noise or movement; grant appropriate regard for customer's unique needs; exhibit capacity to ascertain best service for the particular request Attributes of maximum functioning capacity (see Appendix A)	Use of numbers (without calculation) - counting, ordering Fundamental operations (calculation) - addition algorithm [rule] Fractions Ratio and proportion Basic measurement skills and concepts Measure sense/role of unit Instrument - tape Measurement: geometric - linear [feet, inches] Read and interpret tables, charts and graphs [scale drawing] Knowledge of geometric relationships - parallel Deductive/inductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Viewing	Inspect, measure, select (miter)	Visual analysis, memory retention, logic, detail/inference, recognition of symbols, codes and emblems, movement
Touching	Plan reading	Discrimination of size and shape

(TASK STATEMENT) HANG NEW GUTTERS AND DOWNSPOUT (ALUMINUM)

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Scaffolding Electric drill and bit Gutter Ferrule Spike Connectors End caps Starting collar Downspout	Layout pitch Mark with chalk line Nail first length of gutter Drill and insert large spike and ferrule Put on connector Pop rivot Continue until job is finished to specifications	SAFETY Hard hat Safety glasses Hard soled shoes Gloves HAZARD Falling objects Flying objects from drilling or hammering Tripping on debris Sharp edges
DECISIONS Determine slant needed Determine whether to preserve the styling	CUES Length to be traversed Drop possible, yet still look good	ERRORS Sag in gutter Too long a span

(TASK STATEMENT) HANG NEW GUTTERS AND DOWNSPOUT (ALUMINUM)

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [hacksaw, pop rivot gun] Centrifugal forces developed by bodies in rotation [drill] Work input, work output, friction and efficiency in simple machines BEHAVIORAL SCIENCE Hiring - exhibit capacity to ascertain personal qualities; to foster trust; to accurately reflect plant environment and job expectations Professionalism - maintain capacity to foster trust and cooperation; to generate integrity; to cope with conflict behavior; to function efficiently when encountering fast changing, multiple, personal or situational variables; exhibit qualities of self-confidence, self-control, self-reliance, self-respect and adaptability Supervision (see Appendix A) Attributes of maximum functioning capacity (see Appendix A)	Set of real numbers [all rational numbers] Fundamental operations (calculation) - addition, subtraction, multiplication and division algorithms, and order of operations, i.e., use of parentheses in simplifying arithmetic expressions Basic measurement skills and concepts Measure sense/role of unit Measurement: geometric - linear Knowledge of geometric relationships - symmetry, congruence, similarity, parallel, perpendicular, skew Deductive/inductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Plan	Comprehension, process report-instructions
Listening	Electric drill (when hole is finished)	Noise discrimination
Viewing	Overview	Visual analysis, memory, logic, detail, recognition of symbols, codes and emblems
Touching	Drilling, nailing	Depth, movement, shape

(TASK STATEMENT) PAINT EXTERIOR

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Scaffolding Paint brushes Scrapers Ladder (steps and extension) Sealer Paint	Prepare surface [caulking, etc.] Seal surface Apply paint evenly Clean tools immediately after finishing	SAFETY Hard hat Safety glasses Hard soled shoes Gloves HAZARD Falling objects Paint in eyes Step on debris Skin disease from paint Ladder slipping

DECISIONS	CUES	ERRORS
Determine type wood and its condition Determine type paint desired	Open joints Open to weather	Wood bleeds Nails are not sunk

(TASK STATEMENT) PAINT EXTERIOR

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [brush] Work input, output, friction and efficiency in simple machines BEHAVIORAL SCIENCE Hiring - exhibit capacity to ascertain personal qualities (skills, knowledge, character, flexibility, learning capacity); to foster trust; to accurately reflect plant environment and job expectations Professionalism - maintain capacity to foster trust, confidentiality, cooperation; to generate integrity; to cope with conflict behavior; to function efficiently when encountering fast changing, multiplie, personal or situational variables; exhibit qualities of self-confidence, self-control, self-reliance, self-respect and adatability Supervision - grant appropriate regard for customer's unique needs; communicate pride in establishment Attributes of maximum functioning capacity (see Appendix A)	Set of real numbers [all rational numbers] Fundamental operations (calculation) - addition, subtraction, multiplication and division algorithms, and order of operations, i.e., use of parentheses in simplifying arithmetic expressions Basic measurement skills and concepts Instruments [tape] Measurement: geometric - linear, area (square feet) [for figuring paint coverage]

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Paint label	Comprehension, detail/inference, instructions
Viewing	Painting	Visual analysis, memory, logic, color discrimination

Duty B Reroofing House

1 Remove old roofing
2 Inspect and replace roof boards
3 Put on building paper
4 Flash edges, valleys, and chimney areas
5 Lay shingles (self-sealing)

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(TASK STATEMENT) REMOVE OLD ROOFING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit	Begin at the top (cap) using small nailpuller and screwdriver, remove cap shingles Remove shingles systematically row by row from the top Clean the roof surface of nails, or any upward protrusions	SAFETY Ladder safety: Check condition of ladder Set bottom out at least ¼ of the ladder length and tie it off Should extend at least 2 inches beyond need Safety-general: Wear soft-soled shoes Be careful near edges Keep walking area clear of debris Do not go near the edge HAZARD Hard soles slip easily on the incline Cracks in ladders, often become breaks under vibration and stress

DECISIONS	CUES	ERRORS
Determine method of collecting old shingles until able to haul them away	Condition of shingles	Littering of surrounding area

(TASK STATEMENT) REMOVE OLD ROOFING

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [wrecking bar, small nail puller and screwdriver] Work input, output, friction and efficiency in simple machines BEHAVIORAL SCIENCE Professionalism - exhibit qualities of self-confidence, self-reliance, self-control, self-respect, adatability Supervision - maintain customer's illusion of privacy by avoiding excessive noise or movement; communicate pride in establishment All attributes of maximum functioning capacity Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation Conscious awareness of physical expressions basic to peak physical performance Conscious awareness of qualities basic to optimal mental performance	Set of real numbers [all rational numbers] Use of numbers (without calculations) - counting, coordinate system, ordering, indexing, coding, ratio, measurement, recording Fundamental operations (calculations) addition, subtraction multiplication, division algorithm, and order of operations, i.e. use of parentheses in simplifying arithmetic expressions Measurement: geometric - linear, square

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Viewing	Pattern of shingle	Visual analysis, logic, detail/inference

(TASK STATEMENT) INSPECT AND REPLACE ROOF BOARDS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit 1 x 12 inch sheathing boards	Visually distinguish rot or cracks Test for soundness by tapping Remove and replace bad members	SAFETY Gloves Soft soled shoes Carefully approach roof edge Keep path clear of nails HAZARD Burns and cuts Slipping Fall off roof, board breaks Step on a nail, puncture wound
DECISIONS	**CUES**	**ERRORS**
Determine if the crack actually weakens the structure Determine if the member can be removed safely	Plan indicates support wall Discoloration–indicating rot	Surface appears solid, but is not Remove a crucial member without temporary support

(TASK STATEMENT) INSPECT AND REPLACE ROOF BOARDS

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [hammer, wrecking bar] Relationship of force to distortion in an elastic body Resistance of materials to change in shape BEHAVIORAL SCIENCE Hiring - exhibit capacity to accurately reflect plant environment and job expectations Professionalism - exhibit qualities of self-confidence, self-control, self-reliance, self-respect, and adaptability All attributes of maximum functioning capacity Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation Conscious awareness of physical expressions basic to peak physical performance Conscious awareness of qualities basic to optimal mental performance	Set of real numbers [all rational numbers] Use of numbers (without calculations) - counting, ordering coordinate system, indexing, coding, ratio, measurement, recording Basic measurement Measure sense/role of unit Instruments - tape Measurement: geometric - linear

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading Viewing	House plan Inspection	Comprehension, detail, process report Visual analysis, memory, logic, color discrimination, recognition of code

(TASK STATEMENT) PUT ON BUILDING PAPER

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Materials: roofing nails, roofing paper, tar	Clear boards of nails Install building paper 1 inch overhang Continue to peak 4 inch – overlap Tar edges of each strip Nail every 6 inches	SAFETY Ladder safety Soft shoes Gloves HAZARD Faulty ladders Falling off roof Burns from tar
DECISIONS Determine time	**CUES** Weather	**ERRORS** Chose wrong day – loss of time

(TASK STATEMENT) PUT ON BUILDING PAPER

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [hammer] Work input, output, friction and efficiency in simple machines BEHAVIORAL SCIENCE Exhibit qualities of self-confidence, self-reliance, self-respect, self-control and adaptability All attributes of maximum functioning capacity Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation Conscious awareness of physical expressios basic to peak physical performance Conscious awareness of qualities basic to optimal mental performance	Set of real numbers [rational numbers] Use of numbers (without calculations) - counting, coordinate system, ordering, indexing, coding, ratio, measurement, recording Fundamental operations (calculation) - addition, subtraction, multiplication, and division algorithms, and order of operations, i.e., use of parentheses in expressions Rule of thumb Measure sense, tape measure

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading Viewing	Directions on roll	Comprehension, detail/inference Visual analysis, memory, logic

(TASK STATEMENT) FLASH EDGES, VALLEYS, AND CHIMNEY AREAS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Straight edge Materials: flashing,tar, roofing nail	Position flashing Secure flashing Cut ends, shape	SAFETY Soft soled shoes Ladder safety Gloves HAZARD Falling Too close to edge of roof Burns from tar

DECISIONS	CUES	ERRORS
Determine style Determine protection needed	Visual inspection Weather direction Pitch of roof	Improper bending Sharp edges protruding Faulty seal

(TASK STATEMENT) FLASH EDGES, VALLEYS, AND CHIMNEY AREAS

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [hammer, tin shears] Work input, output, friction and efficiency in simple machines Transfer of heat from one body to another BEHAVIORAL SCIENCE Professionalism - exhibit qualities of self-confidence, self-reliance, self-respect, and adaptability Supervision - communicate pride in establishment All attributes of maximum functioning capacity Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation Conscious awareness of physical expressions basic to peak physical performance Conscious awareness of qualities basic to optimal mental performance	Set of real numbers [all rational numbers] Use of numbers (without calculations) - counting, coordinate, ordering, indexing, coding, ratio, measurement, recording Fundamental operations (calculations) - addition, subtraction, multiplication, division algorithm and order of operations, use of parentheses in arithmetic expressions Reduction of fractions Properties of the real number system - commutative, associative, distributive, identity of one, identity of zero, multiplication by zero, transitive, inverses multiplicative and additive Instruments - tape Measurement: geometric - linear

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Viewing	Planning flashing	Visual analysis, memory, logic, detail/inference
Touching	Smoothing edges	Texture

(TASK STATEMENT) LAY SHINGLES (SELF-SEALING)

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Standard tool kit Materials: shingles, nails	Layout for first course Strike line Position shingle Secure Continue to top Cap	SAFETY Wear soft soled shoes Use caution at roof edges Use wood strips to provide footing Carefulness in lifting shingle (small amounts) Ladder safety HAZARD Slipping Falling off edge of roof Hernia Falling through ladder
DECISIONS	**CUES**	**ERRORS**
Determine style and pattern expectation (customer) Determine quality of shingles Determine weather	Indecision of customer Unusual shape of roof Weather report	Leaky roof

(TASK STATEMENT) LAY SHINGLES (SELF-SEALING)

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [hammer, shears, knife] Input, output, friction and efficiency in simple machines Relationship of force to distortion in an elastic body Resistance of materials to change in shape BEHAVIORAL SCIENCE Hiring - exhibit capacity to ascertain personal qualities and to accurately reflect plant environment and job expectations Professionalism - exhibit qualities of self-confidence, self-control, self-reliance, self- respect and adaptability Supervision - maintain customer's illusion of privacy by avoiding excessive noise of movement; communicate pride in establishment Attributes of maximum functioning capacity (see Appendix A)	Set of real numbers [all rational numbers] Use of numbers (without calculations) - counting, coordinate system, ordering, indexing, coding, ratio, measurement recording Fundamental operations (calculations) - addition, subtraction, multiplication and division algorithms, and order of operations, i.e., use of parentheses in simplifying arithmetic expressions Reduction of fractions Properties of the real number system - commutative, associative, distributive, identity of one, identity of zero, multiplication by zero, transitive, inverses–multiplicative and additive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Instruction	Comprehension, detail/inference, instructions
Viewing	Inspection	Visual analysis, memory, logic, detail/inference, color discrimination, recognition of symbols, codes and emblems
Touching	Shingles	Depth, consistency, texture, movement

Duty C Enlarging A Room

1 Inspect supporting wall areas
2 Install temporary support
3 Remove old partition wall
4 Install new partition frame
5 Modify plumbing (copper)
6 Enlarge electrical capacity
7 Insulate the wall (batting)
8 Install wall covering (plaster board)
9 Paint

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(TASK STATEMENT) INSPECT SUPPORTING WALL AREAS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Blueprints (house plans)	Read house plan Revise house plan Inspect under structure Inspect over structure Formulate plans	SAFETY Hard hat Hard soled shoes Good light HAZARD Falling [through ceiling lathe] Tripping

DECISIONS	CUES	ERRORS
Determine cost Determine efficiency Determine risk to existing structure	Support areas General condition of structure Observations [plumbing, heating, wiring]	Mathematical error [setting]

(TASK STATEMENT) INSPECT SUPPORTING WALL AREAS

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Composition of matter Inertia and momentum Resistance of materials to change in shape BEHAVIORAL SCIENCE Hiring - exhibit capacity to ascertain personal qualities (skills, knowledge, character, flexibility, learning capacity) Professionalism - maintain capacity to function efficiently when encountering fast changing, multiple, personal or situational variables Supervision - maintain customer's illusion of privacy by avoiding excessive noise and movement Attributes of maximum functioning capacity Conscious awareness of the need for a balance (both physi- and mental) between tension and relaxation; conscious awareness of physical expressions basic to peak physical performance; conscious awareness of qualities basic to optimal mental performance	Set of real numbers [all rational numbers] Use of numbers (without calculation) - counting, coordinate system, ordering, indexing, coding, ratio, measurement, recording Fundamental operations (calculation) - addition, subtraction, multiplication and division algorithms, and order of operations, i.e., use of parentheses in simplifying arithmetic expressions Reduction of fractions Ratio and proportion Rule of thumb Properties of the real number system - commutative, associative, distributive, identity of one, identity of zero, multiplication by zero, transitive, inverses–multiplicative and additive Measure sense/role of unit; instruments, precision/tolerance; measurement: geometric - linear and angular; read and interpret tables, charts and graphs [scale drawings] Basic logic - deductive/inductive, implications

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Houseplan	Comprehension, detail/inference, recommendation report, proposal, process report
Listening	Tapping	Noise discrimination
Viewing	Inspection	Visual analysis, memory, logic, detail/inference, color discrimination, recognition of symbols and codes

(TASK STATEMENT) INSTALL TEMPORARY SUPPORT

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Pole jack Materials: 2 x 4 bracing, nails	Insert I-stud support and fasten Insert pole jack under support Make change in wall structure	SAFETY Hard hat Hard shoes Safety glasses Gloves Adequate lighting HAZARD Falling objects Nails and sharp edges Flying objects Tripping
DECISIONS	**CUES**	**ERRORS**
Determine adequate support Determine location of temporary support	Size/shape of room Shift of weight (appliance)	Misjudge live weight load

(TASK STATEMENT) INSTALL TEMPORARY SUPPORT

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [hammer, wrecking bar, jack] Input, output, friction and efficiency of simple machines Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Motion resulting from two or more forces acting on a point Resistance of materials to change in shape BEHAVIORAL SCIENCE Hiring - exhibit capacity to ascertain personal qualities; to foster trust; to reflect accurately plant environment and job expectations Professionalism - exhibit qualities of self-confidence, self-control, self-reliance, self-respect and adaptability Supervision - maintain customer's illusion of privacy and grant appropriate regard for customer's personal space; communicate pride in establishment Attributes of maximum functioning capacity (see Appendix A)	Set of real numbers [all rational numbers] Use of numbers (without calculation) - counting, coordinate system, ordering, indexing, coding, ratio, measurement, recording Fundamental operations (calculation) - addition, subtraction, multiplication and division algorithms and order of operations, i.e., use of parentheses in simplifying expressions Reduction of fractions Properties of comparison Equality/equivalence, inequality/greater than/less than Basic measurement skills and concepts Measuresense/role of unit Instruments Precision Measurement: geometric - linear Knowledge of geometric relationships parallel, perpendicular, skew

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Viewing	Inspection	Visual analysis, memory, describing, logic, detail/inference
Touching	Installation	Size, shape, depth, movement

(TASK STATEMENT) REMOVE OLD PARTITION WALL

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Standard tool kit Objects acted upon: old partition	Remove old covering Remove studs Remove plates Clean up debris	SAFETY Hard hat Safety glasses Gloves HAZARD Falling pieces Flying objects Sharp edges and splinters

DECISIONS	CUES	ERRORS
Determine how to avoid damage to rest of house	Path of removal Airflow (dust and dirt)	Excess dust and dirt in homes

(TASK STATEMENT) REMOVE OLD PARTITION WALL

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [hammer, wrecking bar] Work input, work output, friction and efficiency in simple machines BEHAVIORAL SCIENCE Hiring - exhibit capacity to foster trust Professionalism - maintain capacity to function efficiently when encountering personal or situational varibles Supervision - maintain customers illusion of privacy by avoiding excessive noise or movement; grant appropriate regard for customer's personal space All attributes of maximum functioning capacity Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation Conscious awareness of physical expressions basic to peak physical performance Conscious awareness of qualities basic to optimal mental performance	Set of real numbers [all rational numbers] Use of numbers (without calculations) - counting, coordinate system, ordering, indexing, coding, ratio, measurement, recording Fundamental operations (calculations) - addition, division, subtraction, multiplication algorithm, and order of operations Properties of the real number system - commutative, associative, distributive, identity of one, identity of zero, multiplication by zero, transitive, inverse/multiplicative and additive Measure sense/role of unit Instruments Measure: geometric-linear Basic logic, deductive/inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Viewing	Inspect	Visual analysis, memory, logic, detail and inference, code

(TASK STATEMENT) INSTALL NEW PARTITION FRAME

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Two by four's	Pre-cut parts Position plates Position studs Position headers Secure Raise Secure to old walls	SAFETY Hard hat Safety glasses Gloves HAZARD Falling objects Metal or flying wood splinter

DECISIONS	CUES	ERRORS
Determine if partition is square Determine if partition is plumb	Check with level (vertical and horizontal)	Not thorough enough check

(TASK STATEMENT) INSTALL NEW PARTITION FRAME

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [hammer, saw] Work input/output, friction and efficiency in simple machines Relationship of force to distortion in an elastic body Resistance of materials to change in shape BEHAVIORAL SCIENCE All attributes of maximum functioning capacity Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation Conscious awareness of physical expressions basic to peak physical performance Conscious awareness of qualities basic to optimal mental performance	Set of real numbers [all rational numbers] Basic measurement skills and concepts Instrument: tape Measurement: geometric-linear Knowledge of geometric relationships - symmetry, parallel, perpendicular

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Viewing	Inspection	Visual analysis, memory, logic, detail/inference, recognize codes and symbols
Touching	Nailing	Size, shape, depth, movement

(TASK STATEMENT) MODIFY PLUMBING (COPPER)

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Standard tool kit Propane tank Modifying existing plumbing	Isolate system (closing strategic valves) Draw modified sketch Make cuts Sweat on fittings Continue to completion according to sketch	SAFETY Gloves Safety glasses HAZARD Burns Cuts

DECISIONS	CUES	ERRORS
Determine condition of existing plumbing Determine placement of new controls convenient to customers	Inspection - amount of deposits built up in tubing Have new plumbing, cabinetry available for measuring	One area not viewed has heavy deposits Breakdown in communications concerning new installation

(TASK STATEMENT) MODIFY PLUMBING (COPPER)

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [tubing cutter] Effects of heating and cooling on expansion of materials Composition of matter [copper] Transfer of heat from one body to another BEHAVIORAL SCIENCE (see Appendix A)	Set of real numbers [all rational numbers] Use of numbers (without calculation) - counting, coordinate system, ordering, indexing, coding, ratio, measurement, recording Fundamental operations (calculation) - addition, subtraction, multiplication, division algorithms and order of operations, i.e., use of parentheses in simplifying arithmetic expressions Reduction of fractions Measure sense/role of units Instruments - rule and tape Measurement: geometric - linear and area Basic logic - deductive/inductive Basic geometry skills and concepts (see Appendix B)

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Plan	Comprehension, detail/inference, plays
Writing	Modified plan	Modify details
Listening	Air in line	Noise discrimination
Viewing	Inspection and generalized	Visual analysis, memory, describing, logic, detail/inference, codes
Touching	Constant	Size, shape, constant, temperature, slick, rough, touch carpet

(TASK STATEMENT) ENLARGE ELECTRICAL CAPACITY

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Drill and bit Electric tape Connector Materials: staples, wiring, duplex receptacle and S.T. switch, proper plates	Cut hole for switch box Open existing receptacle Strip cable and connect new wiring Drill and run wire to new supply location Connect	SAFETY Hard hat Safety glasses Gloves HAZARD Falling objects Splinters Wire - sharp Flying objects

DECISIONS	CUES	ERRORS
Determine where to install Determine what weight wire needed Determine point of overload	Code Visual inspection	Drill hole wrong Overload circut Poor connection

(TASK STATEMENT) ENLARGE ELECTRICAL CAPACITY

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [saw, stripper, pliers, cutter] Resistance of materials to flow of electrical current Resistance of materials to change in shape BEHAVIORAL SCIENCE (see Appendix A)	Set of real numbers [positive rationals] Use of numbers (without calculations) counting, ordering, coordinate system, indexing, coding, ratio, measurement, recording Fundamental operations (calculations) addition, subtraction, multiplication and division algorithms, and order of operations, i.e., use of parentheses in simplifying arithmetic expressions Basic measurement skills and concepts - measure sense; instruments: tape, voltmeter; measurement: geometric-linear, area, volume, angle; conversion of units [volts, amperage] Knowledge of geometric relationships - symmetry, congruence, similarity, parallel, perpendicular, skew Basic logic - symbolism, deductive/inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading Writing Viewing	Blueprint Modify plan Installation	Code instructions, skill Reports Visual analysis, logic, code discrimination, recognition of symbols
Touching	Constant	Movement, temperature, shape, texture

(TASK STATEMENT) INSTALL THE [illegible]

TOOLS, EQUIPMENT, MATERIALS OBJECTS ACTED UPON	PERFORMANCE STANDARDS	SAFETY
Standard tool kit Materials: staples, sheets, insulation	Position between studs Staple (secure) Cut and "stuff"	SAFETY Safety glasses Gloves Filter mask HAZARD Flying debris Protect hands from fiberglass Avoid creating harmful [illegible] materials

DECISIONS	CUES	ERRORS
Determine type Determine thickness Determine width	Type heating, cooling Spread of studs	Over-insulate (moisture problem) Under-insulate (BTU loss)

(TASK STATEMENT) INSULATE THE WALL (BATTING)

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [shears, staple gun] Work input, work output, friction and efficiency in simple machines Absorption and reflection of heat Transfer of heat from one body to another BEHAVIORAL SCIENCE (see Appendix A)	Set of real numbers [all rational numbers] Use of numbers (without calculations) - counting, coordinate system, ordering, indexing, coding, ratio, measurement, recording Fundamental operations (calculations)-addition, subtraction, algorithms, and order of operations, i.e., use of parentheses in simplifying arithmetic expressions Reduction of fractions Measure sense/role of units Instruments - rule and tape Measurement: geometric - linear and area [square feet] Basic logic - deductive/inductive

COMMUNICATIONS		
PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Viewing Touching	General inspection Routine	Visual analysis, memory, logic Size, shape, temperature, slick, rough

(TASK STATEMENT) INSTALL WALL COVERING (PLASTER BOARD)

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY HAZARD
Standard tool kit Sponge Plasterboard Spackling compound Perforated joint tape Plasterboard nails	Measure room Cut sheet rock to fit Install - secure Prepare joint cement Bed joints Position tape Apply tape and bed coat Smooth Apply smooth coat Go over with wet sponge Bed nail holes Float nail holes Go over with sponge	SAFETY Safety glasses Ladder safety HAZARD Falling Tripping

DECISIONS	CUES	ERRORS
Determine if smooth enough	Looking and feeling texture	Leave too much plaster Remove too much plaster

(TASK STATEMENT) INSTALL WALL COVERING (PLASTER BOARD)

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [hammer and putty knives] BEHAVIORAL SCIENCE (see Appendix A)	Set of real numbers [all rational numbers] Use of numbers (without calculations) counting, coordinate system, ordering, indexing, coding, ratio, measurement, recording Fundamental operations (calculations) addition, subtraction, multiplication and division algorithms, and order of operations, i.e., use of parentheses in simplifying arithmetic expressions Measure sense; instrument: rule, measurement: geometric-linear Knowledge of geometric relationships - symmetry, congruence, similarity, parallel, perpendicular, skew Basic logic - deductive/inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Listening Viewing Touching	Solid (tapping) In general Normal mechanical	Noise discrimination Visual analysis, memory, logic, detail and inference Shape, depth, consistency, texture, movement

(TASK STATEMENT) PAINT

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Tools: ladder, paint brushs, drop cloths Materials: sealer, paint	Seal surfaces Apply paint evenly Clean tools immediately Repeat for second coat	SAFETY Ladder safety Caution against spillage HAZARD Falling Tripping Spilling or dropping paint
DECISIONS Determine color expectation Determine type of paint Determine amount of coverage	**CUES** Customer selection from charts Use for room–washable paint needed, etc Number of coats needed - can label and inspecting coverage	**ERRORS** Paint does not meet customer's expectation Coverage does not match can label description resulting in extra cost

(TASK STATEMENT) PAINT

SCIENCE	MATH – NUMBER SYSTEMS
BEHAVIORAL SCIENCE (see Appendix A)	Set of real numbers [all rational numbers] Use of numbers (without calculations) counting, coordinate system, ordering, indexing, coding, ratio, measurement, recording Fundamental operations (calculations) addition, subtraction, multiplication and division order of operations, i.e., use of parentheses in simplifying arithmetic expressions Measure sense, tape measure; measure: geometric-linear and area Basic logic - deductive/inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading Listening Viewing Touching	Discussion for customer selection Label on can To customer selection General Testing	Usage Comprehension, detail/inference, instructions Concentration, note taking Visual analysis, memory, logic, color discrimination Texture

Duty D Adding A Room

1 Layout for addition
2 Dig for and build foundation forms
3 Pour concrete
4 Lay block foundation (crawl space)
5 Build subfloor
6 Put up shell (walls)
7 Install ceiling joists and roof rafters, sheathing
8 Extend heating ducts
9 Wire the structure
10 Install windows
11 Install plumbing
12 Install ceiling
13 Install floor, covering (kitchen carpeting)

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(TASK STATEMENT) LAYOUT FOR ADDITION

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Materials: stakes, string	Establish lot lines Consult code Square building - a. continuance of building line. b. diagonal method c. 6-8-10 method Set up batter boards Install lines on batter board Establish footer level on batter boards	SAFETY Safety glasses HAZARD Flying objects

DECISIONS	CUES	ERRORS
Determine if addition fits code Determine if the original structure is level and square	Checking structure level Checking overall measurement Spot checking inside and out for square	Siding is out, frame is square Mathematical error in computation

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(TASK STATEMENT) LAYOUT FOR ADDITION

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [sledge hammer] Resistance of materials to change in shape [stretching line] BEHAVIORAL SCIENCE (see Appendix A)	Set of real numbers [all rational numbers] Use of numbers (without calculation) - counting, coordinate system, ordering, indexing, coding, ratio, measurement, recording Fundamental operations (calculation) - addition, subtraction multiplication, and division algorithm, and order of operations, i.e., use of parentheses in simplifying arithmetic expressions Measure sense/role of units; instruments - rule and tape, Measurement: geometric - linear and area Geometric relationships - symmetry, congruence, similarity, parallel, perpendicular, skew Understanding and use of the Pythagorean theorem, based on the right triangle ($a^2 + b^2 = c^2$) Basic logic - deductive/inductive Reduction of fractions

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COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking	Discussion	Usage
Reading	Code plans	Comprehension, detail/inference, definition, terminology, process report
Writing	Notes on conference, sketch details	Description, denotative words, logic, usage
Listening	To customer	Concentration, logic, note taking
Viewing	General	Visual analysis, memory, describing, logic, detail/inference, codes and symbols

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(TASK STATEMENT) DIG FOR AND BUILD FOUNDATION FORMS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Wheel barrow, pointed shovel Pointed shovel Pick Materials: framing lumber, nails, bracing, reinforcement rods and wire	Excavate for footers Build forms Level forms Put in reinforcement materials	SAFETY Hard hat Safety glasses Gloves HAZARD Flying chips, etc. Sharp edges

DECISIONS	CUES	ERRORS
Determine if forms are square Determine if forms are level Determine if forms are strong enough	Checking with straight edge and level Check with square and tape (6-8-10) Instructions and memory (strength)	Misread level Miscalculate for squareness

(TASK STATEMENT) DIG FOR AND BUILD FOUNDATION FORMS

SCIENCE	MATH - NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [hammer, pick, shovel, pliers, etc.] Work input/output, friction and efficiency in simple machines BEHAVIORAL SCIENCE Hiring - exhibit capacity to ascertain personal qualities; to foster trust; to accurately reflect plant environment and job expectations Professionalism - maintain capacity to foster trust, confidentiality, cooperation; to generate integrity; to cope with conflict behavior; to function efficiently when encountering fast changing, multiple, personal or situational variables; exhibit qualities of self-confidence, self-control, self-reliance, self-respect and adaptability Supervision (see Appendix A) Attributes of maximum functioning capacity (see Appendix A)	Set of real numbers [all rational numbers] Use of numbers (without calculations) counting, coordinate system, ordering, indexing, coding, ratio, measurement, recording Fundamental operations (calculations) Addition, subtraction, multiplication and division algorithms and order of operations, i.e. use of parentheses in simplifying arithmetic expressions Reduction of fractions, ratio and proportion, properties of the real number system: commutative, associative, distributive, identity of one, identity of zero, multiplication by zero, transitive, inverses-multiplicative and additive Measure sense/role of unit; instruments: tape; measurement: geometric-linear and area; read and interpret tables, charts, and graphs Basic geometric skills and concepts (see Appendix B) Basic logic - deductive/inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading Viewing	Plan General	Comprehension, detail/inference, instructions Visual analysis, memory, logic, detail and inference, codes

(TASK STATEMENT) POUR CONCRETE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Tools: shovel, floats, trowel, leveling board Materials: pre-mixed concrete, water	Pour cement Shovel into far corners Work with tamper Work with leveling board Float surfaces Float and trowel again as sets up	SAFETY Safety glasses Gloves HAZARD Cement getting into eyes Harm of cement to hands

DECISIONS	CUES	ERRORS
Determine if cement is wet enough to work Determine if there are air pockets Determine if the water is worked off	Flows sufficiently Knowledge of concrete problems Observation	Settles later Water drips (wavy)

(TASK STATEMENT) POUR CONCRETE

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [shovel, etc.] Work input, work output, friction and efficiency in simple machines BEHAVIORAL SCIENCE Hiring - exhibit capacity to ascertain personal qualities; to foster trust; to accurately reflect plant environment and job expectations Professionalism - maintain capacity to foster trust, confidentiality, cooperation; to generate integrity; to cope with conflict behavior; to function efficiently when encountering fast changing, mulciple, personal or situational variables; exhibit qualities of self-confidence, self-control, self-reliance, self-respect and adaptability Supervision (see Appendix A) Attributes of maximum functioning capacity (see Appendix A)	Rule of thumb Basic geometric skills and concepts (see Appendix B)

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Viewing	General	Visual analysis, memory, logic
Touching	General	Consistency, texture

(TASK STATEMENT) LAY BLOCK FOUNDATION (CRAWL SPACE)

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Tools: trowels, shovel, hoe, mortar box, jointer, anchor bolts, level straightedge, square, chalkline, chipping hammer Material: sand, cement, blocks	Mix mortar Install corners Stretch mason line between corners one course at a time Apply mortar Lay block Strike the joints Continue with succeeding courses until wall is proper height Fill top course with concrete Embed anchor bolts	SAFETY Hard shoes Safety glasses Gloves HAZARD Falling blocks Splashing mortar into eyes Sharp edges on block
DECISIONS	**CUES**	**ERRORS**
Determine how to maintain level Determine how to maintain square	Constant check	Out of square, off on level

(TASK STATEMENT) LAY BLOCK FOUNDATION (CRAWL SPACE)

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [chipping hammer, etc.] Work input, work output, friction and efficiency in simple machines BEHAVIORAL SCIENCE Hiring - exhibit capacity to ascertain personal qualities; to foster trust; to accurately reflect plant environment and job expectations Professionalism - maintain capacity to foster trust, confidentiality, cooperation; to generate integrity; to cope with conflict behavior; to function efficiently when encountering fast changing, multiple, personal or situational variables; exhibit qualities of self-confidence, self-control, self-reliance, self-respect and adaptability Supervision (see Appendix A) Attributes of maximum functioning capacity (see Appendix A)	Set of real numbers [all rational numbers] Fundamental operations (calculation)-addition, subtraction, multiplication, division algorithm, and order of operations Use of numbers (without calculation) - counting, coordinate system, ordering, indexing, coding, ratio, measurement, recording Reduction of fractions, ratio and proportion, properties of the real number system (commutative, associative, distributive, identity of one, identity of zero, multiplication by zero, transitive, inverses/multiplicative and additive) Measure sense/role of unit, instruments, Measurement: geometric - linear and area Geometric relationships - symmetry, congruence, similarity, parallel, perpendicular, skew Recognize and identify basic geometry figures, planes and solid Basic logic - deductive/inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Instructions	Process report
Viewing	General	Visual analysis, memory, logic, detail and inference, recognize code
	Blueprint	Recognize code
Touching	Laying block	Size, shape, depth, consistency, texture, movement

(TASK STATEMENT) BUILD SUBFLOOR

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Tools: standard tool kit, electric skill saw Materials: 2 x 10's, 2 x 8's, sheathing	Cut and place T-sill (box) over block wall, secure to anchor bolts Place 2'' x 10'' joist's every 16'' Place (1) 1'' x 12'' sheathing board at 45° angle across the corner of box Nail every 6'', collowing joist Continue operation across entire frame-work Trim excess sheathing, carefully chalk-ing the outside perimeter, make cut with electric skill saw	SAFETY Hard hat Safety glasses Gloves Hard soled shoes HAZARD Falling objects (from overhead) Flying debris Protect hands - splinters, etc. Stepping on nail

DECISIONS	CUES	ERRORS
Determine how to avoid excessive waste	Spacing knowledge	Extra cost for wasted sheathing

(TASK STATEMENT) BUILD SUBFLOOR

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [hammer, etc.] Work input, work output, friction and efficiency in simple machines BEHAVIORAL SCIENCE Hiring - exhibit capacity to ascertain personal qualities; to foster trust; to accurately reflect plant environment and job expectations Professionalism - maintain capacity to foster trust, confidentiality, cooperation; to generate integrity; to cope with conflict behavior; to function efficiently when encountering fast changing, multiple, personal or situational variables; exhibity qualities of self-confidence, self-control, self-reliance, self-respect and adaptability Supervision (see Appendix A) Attributes of maximum functioning capacity (see Appendix A)	Set of real numbers [all rational numbers] Use of numbers (without calculation) - counting, coordinate system, ordering, indexing, coding, ratio, measurement, recording Fundamental operations (calculation) - addition, subtraction, multiplication, division algorithms, and order of operations, i.e., use of parentheses in simplifying arithmetic expressions Reduction of fractions Measure sense/role of units Instruments - rule and tape Measurement: geometric - linear, area, and angle Conversion from one standard unit to another Basic logic - deductive/inductive Knowledge of geometric relationships - symmetry, comgruence, similarity, parallel, perpendicular, skew

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Plans	Process report
Listening	Nailing	Noise discrimination
Viewing	General	Visual analysis, memory, describing, logic, detail and inference
Touching/feeling	General	Codes, size, shape, depth, movement

(TASK STATEMENT) PUT UP SHELL (WALLS)

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY — HAZARD
Standard tool kit Materials: 2 x 4's, ½'' sheathing plywood, nails (16 D)	Layout on subfloor wall location Cut and layout sole plates Mark sole plates every 16'' O.C. Mark stud location with ''X'' and cripple location with ''O'' Pre-cut studs and cripples following plan Assemble outside walls Set outside walls in place and secure to subfloor Square plumb and brace Cut and secure outer sheathing	SAFETY Hard hat Glasses Gloves Shoes Ladder safety HAZARD Falling objects Nailing Cuts Flying chips Ladder slipping
DECISIONS Determine if plan has been followed	**CUES** Recheck plan	**ERRORS** Misread plans

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(TASK STATEMENT) PUT UP SHELL (WALLS)

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [hammer] Work input, work output, friction and efficiency in simple machines BEHAVIORAL SCIENCE Hiring - exhibit capacity to ascertain personal qualities; to foster trust; to accurately reflect plant environment and job expectations Professionalism - maintain capacity to foster trust, confidentiality, cooperation; to generate integrity; to cope with conflict behavior; to function efficiently when encountering fast changing, multiple, personal or situational variables; exhibit qualities of self-confidence, self-control, self-reliance, self-respect and adaptability Supervision (see Appendix A) Attributes of maximum functioning capacity (see Appendix A)	Set of real numbers [all rational numbers] Use of numbers (without calculation) - counting, coordinate system, ordering, indexing, coding, ratio, measurement, recording Fundamental operations (calculation) - addition, subtraction, multiplication, division algorithms, and order of operations, i.e., use of parentheses in simplifying arithmetic expressions Reduction of fractions Measure sense/role of units Instruments - rule and tape Measurement: geometric - linear and area Basic logic - deductive/inductive, symbolism Recognize and identify basic geometry figures, plane and solid Knowledge of geometric relationships - symmetry, congruence, similarity, parallel, perpendicular, skew

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking	General team	Clarity of expression, logic
Reading	Plans	Comprehension, detail and inference, instruction
Listening	Teamwork	Concentration, logic
Viewing	General	Visual analysis, memory, describing, logic, detail and inference, code
Touching	General	Size, shape, depth, texture, movement

(TASK STATEMENT) INSTALL CEILING JOISTS AND ROOF RAFTERS, SHEATHING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY -- HAZARD
Standard tool kit Materials: 2 x 8 ceiling joists	Cut ceiling joist Place and nail following plans 16'' O.C. (exactly on top of studs in wall) X brace joists Determine, cut, and fit four roof joists and ridge board If nesting properly, brace and square Secure Fill in roof 16'' O.C. securing each one Install attic studs Square and plumb Secure in attic sheathing Secure roof sheathing Trim roof sheathing	SAFETY Hard hat Safety glasses Gloves Ladder safety Danger at roof edge HAZARD Falling objects, bumping head Flying chips Splinters Condition of ladders, positioning Falling off roof

DECISIONS	CUES	ERRORS
Determine if they are square and plumb according to plan	Consult plan and double check	Out of plumb, square, or missing cripples

(TASK STATEMENT) INSTALL CEILING JOISTS AND ROOF RAFTERS, SHEATHING

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [hammers, etc.] Work input, work output, friction and efficiency in simple machines BEHAVIORAL SCIENCE Hiring - exhibit capacity to ascertain personal qualities; to foster trust; to accurately reflect plant environment and job expectations Professionalism - maintain capacity to foster trust, confidentiality, cooperation; to generate integrity; to cope with conflict behavior; to function efficiently when encountering fast changing, multiple, personal or situational variables; exhibit qualities of self-confidence, self-control, self-reliance, self-respect and adaptability Supervision (see Appendix A) Attributes of maximum functioning capacity (see Appendix A)	Set of real numbers [all rational numbers] Use of numbers (without calculation) - counting, coordinate system, ordering, indexing, coding, ratio, measurement, recording Fundamental operations (calculation) - addition, subtraction, multiplication, division algorithms, and order of operations, i.e., use of parentheses in simplifying arithmetic expressions Reduction of fractions Measure sense/role of units Instruments - rule and tape Measurement: geometric - linear and area Basic logic - deductive/inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking	General (team work)	Clarity of expression, logic
Reading	Plans	Comprehension, detail/inference, instructions
Viewing	General inspection	Visual analysis, memory, describing, logic, detail and inference, recognize code and symbols
Touching	General	Size, shape, depth, texture, movement

(TASK STATEMENT) EXTEND HEATING DUCTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Standard tool kit Materials: ducts(trunk) roundpipe (lead off's), elbows, boots, register	Cut subfloor for register opening Install boot Install and fit extension of trunk duct Install round pipe (leads between trunk duct and boot) Wrap same ducts with insulation materials	SAFETY Gloves HAZARD Cutting hands on sharp metal
DECISIONS	**CUES**	**ERRORS**
Determine how to avoid custom fitting	Comparing duct lengths to other structures components (on plans)	Must make custom fit

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(TASK STATEMENT) EXTEND HEATING DUCTS

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [rubber mallet, tin shears, screwdriver, etc.] Work input, work output, friction and efficiency in simple machines Resistance of materials to change in shape [bending] BEHAVIORAL SCIENCE Hiring - exhibit capacity to ascertain personal qualities; to foster trust; to accurately reflect plant environment and job expectations Professionalism - maintain capacity to foster trust, confidentiality, cooperation; to generate integrity; to cope with conflict behavior; to function efficiently when encountering fast changing, multiple, personal or situational variables; exhibit qualities of self-confidence, self-control, self-reliance, self-respect and adaptability Supervision (see Appendix A) Attributes of maximum functioning capacity (see Appendix A)	Set of real numbers [all rational numbers] Use of numbers (without calculation) - counting, coordinate system, ordering, indexing, coding, ratio, measurement, recording Fundamental operations (calculation) - addition, subtraction, multiplication, division algorithms, and order of operations, i.e., use of parentheses in simplifying arithmetic expressions Reduction of fractions Measure sense/role of units Instruments - rule and tape Measurement: geometric - linear and area Basic logic - deductive/inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking	To partner	Clarity of expression, logic
Reading	Plans	Comprehension, detail and inference, instructions (plan)
Listening		Concentration, logic
Viewing	General inspection	Visual analysis, memory, describing, logic, detail and inference, recognition of code

(TASK STATEMENT) WIRE THE STRUCTURE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY HAZARD
Standard tool kit Special speed bits for drill Materials: wire, receptacles, covers, wire nuts, junction box, plugs, switches	Locate position switches and plugs (code and convenience) Rough in receptacle and switches (notch and drill) Run wires to above and to junction box Run lead wire from junction box to fuse box (main) Connect switches and receptacles Put covers on same Test for efficiency	SAFETY Safety glasses Gloves HAZARD Flash Sharp wire or splinters Flying objects Electric shock
DECISIONS	**CUES**	**ERRORS**
Determine customer's needs Determine room usage	Discuss with customer Consult plans	Misunderstood customer Misread plans

(TASK STATEMENT) WIRE THE STRUCTURE

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechianical advantage [pliers, hammer, etc.] Work input and work output, friction, and efficiency in simple machines Resistance of materials to flow of electricity Resistance to change in shape (bending) BEHAVIORAL SCIENCE Hiring - exhibit capacity to ascertain personal qualities; to foster trust; to accurately reflect plant environment and job expectations Professionalism - maintain capacity to foster trust, confidentiality, cooperation; to generate integrity; to cope with conflict behavior; to function efficiently when encountering fast changing, multiple, personal or situational variables; exhibit qualities of self-confidence, self-control, self-reliance, self-respect and adaptability Supervision (see Appendix A) Attributes of maximum functioning capacity (see Appendix A)	Set of real numbers [all rational numbers] Use of numbers (without calculation) - counting, coordinate system, ordering, indexing, coding, ratio, measurement, recording Fundamental operation (calculation) - addition, subtraction, multiplication, division algorithms, and order of operations, i.e., use of parentheses in simplifying arithmetic expressions Ratio and proportion Reduction of fractions Measure sense/role of units Instruments - rule and tape, voltmeter Measurement: geometric - linear and area Basic logic - deductive/inductive, symbolism

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking	With customer	Clarity of expression, logic
Reading	Plans	Comprehenison, detail/inference, plans and instructions
Listening	To customer	Recognize opinions, logic, note taking
Viewing	Plans, general inspeciton	Visual analysis, memory, logic, detail and inference, color discrimination, code
Touching	General	Size, shape, construction, temperature, slick, rough

(TASK STATEMENT) INSTALL WINDOWS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Standard tool kit Materials: window, trim, shems, nails	Center window in opening Plumb sides Temporarily secure Level window Temporarily secure Recheck for plumb and leveling Permanently nail	SAFETY Safety glasses HAZARD Flying splinters or nail head
DECISIONS Determine if installed according to plan Determine if ordered correct windows	**CUES** Measure opening and window Reconsult plan	**ERRORS** Wrong window sent Made rough opening wrong

(TASK STATEMENT) INSTALL WINDOWS

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [hammer] Work input and work output, friction and efficiency in simple machines Relationship of force to distortion in an elastic body [denting wood] Resistance of change in shape [bending nail] BEHAVIORAL SCIENCE Hiring - exhibit capacity to ascertain personal qualities; to foster trust; to accurately reflect plant environment and job expectations Professionalism - maintain capacity to foster trust, confidentiality, cooperation; to generate integrity; to cope with conflict behavior; to function efficiently when encountering fast changing, multiple, personal or situational variables; exhibit qualities of self-confidence, self-control, self-reliance, self-respect and adaptability Supervision (see Appendix A) Attributes of maximum functioning capacity (see Appendix A)	Set of real numbers [all rational numbers] Use of numbers (without calculation)- counting, coordinate system, ordering, indexing, coding, ratio, measurement, recording Fundamental operations (calculation)- addition, subtraction, multiplication, division algorithm, and order of operations Reduction of fractions Basic measurement skills: Measure sense/role of unit Instruments: rule, tape Measurement: geometric linear Basic geometric skills and concepts (see Appendix B) Basic logic Symbols Deductive/inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking	To customer, helper	Clarity of expression, logic
Reading	Plans, notes	Comprehension, detail/inference, instructions
Listening	General	Recognize opinions, concentration, logic, note taking
Viewing	Plans general	Visual analysis, memory, logic, detail and inference, recognition of code

(TASK STATEMENT) INSTALL PLUMBING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Standard tool kit Materials: copper tubing, fittings, valves, flux, solder, propane tanks, steel wool	Locate areas to be plumbed Drill holes, notch for installation Cut tubing to correct sizes Clean fittings to correct sizes Apply flux Assemble and install Sweat fittings Sweat on valves Connect to existing plumbing system Install drains Connect to existing drainage system Open for service, check for leaks	SAFETY Gloves Safety glasses Asbestos backing sheets HAZARD Burns on hands Flying materials hit eyes Catch house on fire

DECISIONS	CUES	ERRORS
Determine if plumbings meets customer's needs Determine if plumbings corresponds to code	Talk to customer Consult plans Check plumbing code book	Does not please customer Misread code

(TASK STATEMENT) INSTALL PLUMBING

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [tubing cutter, etc.] Work input, work output, friction and efficiency in simple machines Effects of heating and cooling on expansion of materials Transfer of heat from one body to another Resistance of materials to change in shape [bending] BEHAVIORAL SCIENCE (see Appendix A)	Set of real numbers [all rational numbers] Use of numbers (without calculation)- counting, coordinate system, ordering, indexing, coding, ratio, measurement, recording Fundamental operations (calculation) - addition, subtraction, multiplication, division algorithms, and order of operations, i.e., use of parentheses in simplifying arithmetic expressions Reduction of fractions Measure sense/role of units Instruments - rule and tape Measurement: geometric - linear and area Basic logic - deductive/inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking	To customer, help	Clarity of expression, logic
Reading	Plans, notes	Comprehension, detail/inference, instructions
Writing	Notes	Notes on change
Listening	General	Discriminate facts from non-facts, recognize opinions, concentration, logic, note taking
Viewing	General and inspection	Visual analysis, memory, describing, logic, detail and inference, recognize code

(TASK STATEMENT) INSTALL CEILING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY HAZARD
Standard tool kit Jolly board Plaster board, 4 x 8 Nails Spackling compound Tape	Decide most efficient starting point Raise plaster board into place Raise jolly board to hold plaster board up Nail one corner Shift plasterboard to exact permanent position Nail in place every 6'' along ceiling joists Dimple each nail head Finish surface	SAFETY Hard hat Safety glasses Ladder safety HAZARD Bumping head Flying objects Ladder slips or breaks, leading to a fall
DECISIONS	**CUES**	**ERRORS**
Determine best place to start for efficiency and economy	Measure and compute Past experience	Starting wrong place, lead to too much time and energy

(TASK STATEMENT) INSTALL CEILING

SCIENCE	MATH – NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [hammer, jolly board] Work input, work output, friction and efficiency in simple machines Relationship of force to distortion in an elastic body [dimpling] BEHAVIORAL SCIENCE Hiring - exhibit capacity to ascertain personal qualities; to foster trust; to accurately reflect plant environment and job expectations Professionalism - maintain capacity to foster trust, confidentiality, cooperation; to generate integrity; to cope with conflict behavior; to function efficiently when encountering fast changing, multiple, personal or situational variables; exhibit qualities of self-confidence, self-control, self-reliance, self-respect and adaptability Supervision (see Appendix A) Attributes of maximum functioning capacity (see Appendix A)	Set of real numbers [all rational numbers] Use of numbers (without calculation) - counting, coordinate system, ordering, indexing, coding, ratio, measurement, recording Fundamental operations (calculation) - addition, subtraction, multiplication, division algorithms, and order of operations, i.e., use of parentheses in simplifying arithmetic expressions Reduction of fractions Measure sense/role of units Instruments - rule and tape Measurement: geometric - linear and area Basic logic - deductive/inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading Listening	General Plans Plan in general	Clarity, logic, gestures Comprehension, detail/inference, instructions Visual analysis, memory, describing, logic, detail and inference, recognition of code

(TASK STATEMENT) INSTALL FLOOR, COVERING (KITCHEN CARPETING)

TOOLS, EQUIPMENT, MATERIALS OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Standard tool kit Carpet knife and mastic spreader Straight edge Materials: wood putty, ¾'' plywood 4' x 8', spiral nails, carpet (kitchen), mastic	Cut and secure plywood Fill cracks with putty Lay down carpet Rough cut carpet Roll back carpet Spread mastic 4' or 5' square Roll out carpet (position) Trim edges Roll back carpet (except center area) Apply mastic and roll out Roll over entire carpet in all directtions with a no. 50 roller	SAFETY Safety glasses General caution HAZARD Flying nail head Bumping head Cutting hands

DECISIONS	CUES	ERRORS
Determine room size, offsets	Inspection, measuring, memory of past experience	Cut off too much on rough cut

(TASK STATEMENT) INSTALL FLOOR, FLOOR COVERING (KITCHEN CARPETING)

SCIENCE	MATH -- NUMBER SYSTEMS
PHYSICAL SCIENCE Simple machines used to gain mechanical advantage [hammer] Work input, work output, friction and efficiency in simple machines Resistance of material to change in shape [pressure on carpet knife, balde may break] BEHAVIORAL SCIENCE Hiring - exhibit capacity to ascertain personal qualities; to foster trust; to accurately reflect plant environment and job expectations Professionalism - maintain capacity to foster trust, confidentiality, cooperation; to generate integrity; to cope with conflict behavior; to function efficiently when encountering fast changing, multiple, personal or situational variables; exhibit qualities of self-confidence, self-control, self-reliance, self-respect and adaptability Supervision (see Appendix A) Attributes of maximum functioning capacity (see Appendix A)	Set of real numbers [all rational numbers] Use of numbers (without calculation) - counting, coordinate system, ordering, indexing, coding, ratio, measurement, recording Fundamental operations (calculation) - addition, subtraction, multiplication, division algorithms, and order of operations, i.e., use of parentheses in simplifying arithmetic expressions Reduction of fractions Measure sense/role of units Instruments - rule and tape Measurement: geometric - linear and area Basic logic - deductive/inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking	Discuss customer's wants to teamworkers	Clarity of expression, logic gestures
Reading	Directions on mastic	Comprehension, detail/inference, informational reports, instructions
Listening	To customer, to teammate	Recognize opinions, concentration, logic
Viewing	General, inspection	Visual analysis, memory, describing, logic, detail/inference, color discrimination
Touching	On carpet (smoothing)	Texture, movement

APPENDIX A

HIRING

A. Exhibit capacity to ascertain personal qualities (skills, knowledge, character, flexibility, learning capacity)
B. Exhibit capacity to foster trust
C. Exhibit capacity to accurately reflect plant environment and job expectation

PROFESSIONALISM

A. Maintain capacity to foster trust
B. Maintain capacity to foster confidentiality
C. Maintain capacity to foster cooperation
D. Maintain capacity to generate integrity
E. Maintain capacity to cope with conflict behavior
F. Maintain capacity to function efficiently when encountering fast changing, multiple, personal or situational varibles
G. Exhibit qualites of self-confidence, self-control, self-reliance, self-respect, and adaptability

SUPERVISION

A. Distribute personnel with regard to leadership qualities and experiences for optimum team performance
B. Maintain customer's illusion of privacy by avoiding excessive noise or movement
C. Grant appropriate regard for customer's personal space (convenience and special interest)
D. Grant conscious attention to smoothly flowing team work
E. Maintain regard for differing views on maximum efficiency of the operations
F. Grant appropriate regard for customers unique needs
G. Exhibit capacity to ascertain best service for the particular party type requested
H. Show and describe facilities with appropriate speed and clarity
I. Communicate pride in establishment

APPENDIX A CONTINUED

ATTRIBUTES OF MAXIMUM FUNCTIONING CAPACITY

A. Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation. Relates to: Comfort, Caution, Safety, and Physical, emotional, and intellectual health

B. Conscious awareness of physical expressions basic to peak physical performance: Body rhythm, Breathing coordinated with body movement, Body balance and posture, and Movement from tension to relaxation and vice versa

C. Conscious awareness of qualities basic to optimal mental performance: Attention, Observation, Concentration, Mental alertness, Mental quietude, Mental clarity, and Organization

APPENDIX B

BASIC GEOMETRY SKILLS AND CONCEPTS

1. Recognize and identify basic geometry figures, plane and solid
2. Knowledge of geometric relationships
   a. symmetry
   b. congruence
   c. similarity
   d. parallel
   e. perpendicular
   f. skew
3. Understanding and use of the Pythagorean theorem, based on the right triangle ($a^2 + b^2 = c^2$)
4. Determination of area and altitude of triangles
5. Determination of area, perimeter and diagonals of polygons with more than four sides
6. Determination of the area and circumference of circles
7. Use of arcs or chords in determining facts about a circle or its parts
8. Determination of the area of rings
9. Determination of facts involving sectors of a circle
10. Determination of area and perimeter of an ellipse
11. Determination of facts involving lines tangent to circles
12. Determination of area, perimeter and diagonals of quadrilaterals (4-sided figures)
13. Determination of area and volume of rectangular, cube and right triangular prisms
14. Determination of area and volume of cylinders
15. Determination of altitude, area and volume of a right circular cone
16. Determination of lateral area, total area and volume of frustums of pyramids and cones
17. Determination of the surface and volume of a spheres
18. Determination of the volume of a ring
19. Geometric constructions

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